

Effect of Ketotifen as mast cell blocker on sperm parameters and sperm chromatin in unexplained male infertility

Soleimani Asl S.(B.Sc.)¹, Abbasi H.(Ph.D.)², Nasr- Esfahani M.H.(Ph.D.)³, Razavi Sh.(Ph.D.)⁴, Mardani M.(Ph.D.)⁴.

1- M.Sc. Student, Department of Anatomy Sciences, Faculty of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran.

2- Assistant Professor, Department of Urology, Faculty of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran.

3- Assistant Professor, Department of Embryology, Iranian Academic Center for Education, Iran University of Medical Sciences, Tehran, Iran.

4- Assistant Professor, Department of Anatomy Sciences, Faculty of Medicine, Isfahan, University of Medical Sciences, Isfahan, Iran.

Abstract

Introduction: Mast cells play an important role in inflammation, hypersensitivity and fibrosis. Mast cells are normally present in most of peripheral tissues including testes. Studies of literatures suggest that there is a prominent increase in number of testicular mast cells in testes of infertile patients which might result in peritubular fibrosis and consequently disruption in spermatogenesis. Therefore, it appears that treatment with mast cell blockers prevents mast cell release of vasoactive substances and thereby, reduction in inflammation and fibrosis might improve semen parameters. The aim of this study was to evaluate the effect of ketotifen, as a mast cell blocker, on semen parameters and sperm chromatin quality in infertile males.

Materials and Methods: This prospective study was carried out on 10 oligospermic and 14 non-oligospermic infertile males, who referred to Isfahan Fertility and Infertility Center, all of cases had normal gonadotropin and testosterone levels, without female factor defect. The two groups were treated with 1mg ketotifen, twice daily for 3 months. Semen parameters and sperm chromatin (CMA3 and aniline blue staining) were assessed on days 0, 45 and 90 after ketotifen administration. Results were analyzed by SPSS software using paired samples student t-test.

Results: In the oligospermic group, only seminal volume increased significantly on day 45 ($P=0.005$), however on day 90, seminal volume, total sperm density, percentage of normal morphology, normal head morphology and sperms with normal histone were increased significantly ($P\leq 0.05$), though sperm motility decreased ($P=0.025$). Two pregnancies were recorded in this group (20%).

In non-oligospermic infertile males, the sperm density decreased significantly on day 45 compared to day 0 ($P=0.03$), however, this value rebounded to pre-treatment value by day 90 ($P>0.05$). The percentage of sperms with normal morphology, normal head and normal histones increased significantly on day 90 ($P\leq 0.05$), whereas, percentage of protamine deficient sperm decreased significantly ($P\leq 0.05$). Two pregnancies were recorded in this group (14.3%). The mean values of FSH, LH and testosterone did not change significantly before and after treatment ($P>0.05$).

Conclusion: Considering the improved sperm morphology and sperm chromatin quality, treatment with ketotifen as a mast cell blocker is advised for the treatment of unexplained infertility patients. Meanwhile, since the success rate of Assisted Reproduction Technique (ART) depends on the quality of sperm, pretreatment ketotifen is recommended for patients who undergo ART.

Key Words: Mast cells, Ketotifen, Sperm chromatin, Sperm parameters, Oligospermia, and Infertility.

Corresponding Address: Dr. Nasr- Esfahani M.H., Royan Institute, No.36, Simin Alley, Asef Cross, Zaferaniyeh, P.O.Box: 19395- 4644, Tehran, Iran.

E mail: info@royaninstitute.org